Resettlement Administration
Land Utilization Division
Land-Use Planning Section

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PRESENT LAND-USE MAPPING:

Methodology Used by High School Students
State of Washington, 1936

By

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Foreword

Present land-use mapping, as conducted by Dr. Stamp in England, and as conducted by Mr. Landerholm and others in the State of Washington in accordance with the methods set out in the accompanying article, should be considered in the light of the following as to its place in the land-use planning program.

First, present land-use mapping defines and localizes in place the specific uses to which land is now devoted. It also localizes in place present farmsteads, roads, schools, power lines, and other facilities. These are in their present location probably as the result of no systematic or well directed policy, and are in the nature of "hit and miss" settlement, being the result to date of the trial and error method. The present land-use map does not necessarily portray the picture of the best use that might be made of the land. It does not, in any sense, show the adequacy of present use to support a given population, although it may give some indication in that direction. Nor does present land-use mapping show physical quality of the land to an extent sufficient to make forecasts as to best use. It may show some of the local economic and social factors that have thus far been developed, or which exist at the present time.

By reason of the fact that large numbers of people in the local area actually participate in the work of present land-use mapping, much local interest in land problems is created, frequently leading to a desire for more adequate land classification facts to be used as a basis for recommendations concerning future use. It forms the basis of a more detailed and specific study of local conditions in the schools and in community groups.

If an action program of adjustment is undertaken, the present land-use survey should furnish a very important starting point from which adjustments may be made. Wherever an action program is to be undertaken, much of the background material included in such a present land-use survey is necessary in some form.

The data which may be secured by the method hereinafter described will vary with each area in accordance with the needs of a particular State or county. The materials indicated are intended to be suggestive rather than all inclusive.

The value of a present land-use map as a guide to future use varies somewhat in proportion to the length of time the area has been settled. In Vermont, for example, where much of the land

has been in its present use for generations, the mapped picture may be quite indicative, while in the State of Washington where the land has been in its present use only a few years, the picture may be only a slight indicator of future best use. Trends of land-use in local areas within the boundaries covered by the present land use map may be important indicators as to future use.

--Rex E. Willard--

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PRESENT LAND-USE MAPPING

Methodology Used In Mapping With High School Students
State of Washington, 1936

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Sponsored by the Land-Use Committee of the Washington State Planning Concil and the Lewis County Planning Board, present land-use mapping as a high school project was introduced into Washington State in 1934 under the direction of Rex E. Willard, the work being patterned somewhat after that done in England by Dr. L. Dudley Stamp. In 1935-36 a revised and refined map was prepared for Lewis County, and in addition five other counties were mapped by approximately 1,000 students of 27 schools in the six counties who participated in securing the field data.

The Resettlement Administration, under whose guidance the maps were made, provided supervisors to organize and direct the work within the counties. The purpose of this paper is to present the methods used in introducing and directing present land-use mapping in the high schools.

Value of the Present Land-Use Map

The present land-use map shows the use that is being made of the land at present, and affords a convenient starting point for a classification of that land. It is an inventory of present utilization -- a picture of the cover, in which agricultural, recreational, urban, and forest areas are delimited. The present land-use map in itself makes no evaluation of the desirability of that use, but comparisons of present and past uses of various soil types may indicate whether or not their present use is desirable. Intensity of use may also be an indication of the value of that soil.

Educational Value to Participating Students and Others

This work afforded a splendid opportunity for students to

make practical use of their courses in geography, mathematics, civics, sociology, and economics, which heretofore had existed as separate and unrelated subjects, but which were now tied together in the study of their community. A knowledge of the community, and of its relationships to other communities should make it possible for the students to understand more easily and clearly economic and social phenomena. "...the student will see for the first time a composite picture of the community in which he lives. He will see it as an integrated and workable whole..." 1/ Sir Dudley Stamp has said, "There is wide agreement among educators that at some time during a school course a place should be found for the study of the home area and the home environment." 2/

The gathering of the data for a present land-use map, as demonstrated by the Washington study, necessitates concise, accurate observation and evaluation of all the facts pertaining to land use. This training in the observation of facts is of vital importance to the student, as his ultimate success is dependent upon his ability to acquire accurate information.

Training in the construction and the interpretation of maps is of considerable value to the student, since experience has shown that while students have some general knowledge of maps, they are unable accurately to interpret a map or to visualize the area which the map portrays. In the mapping work students become somewhat familiar with the ideas of land planning, and begin to recognize the value to be gained by classifying the land. They are interested in what has been done in the past and what can be done in the future to mitigate the evils that have resulted because of the lack of a sound land policy. Frequently parents have helped their children in the mapping work, both in doing the actual field work, and in the correction or completion of the final maps. Local and state newspapers carried the story of the students' work to the public, and thereby made them more aware of land planning activities.

Foreign countries have for some time recognized the value of this type of work. "In England, Germany, Russia, and Japan, work in local and regional surveying has been an integral part of the educational system for the past few years." 3/

1/ Robert B. Hall, "Local Inventory and Regional Planning in the School," THE JOURNAL OF GEOGRAPHY, January 1934.

2/ L. Dudley Stamp, "Land Utilization Survey as a School and College Exercise", THE JOURNAL OF GEOGRAPHY, April 1934.

3/ Robert B. Hall. Op. cit.
For description of the English work see: L. Dudley Stamp, Op. Cit.: "Land Utilization of Britain", GEOGRAPHICAL REVIEW, October 1934; "The Land Utilization Survey of Britian", GEOGRAPHY, Vol.16,1931.

WORK TO BE DONE AND DATA TO BE GATHERED PRELIMINARY TO WORK WITH HIGH SCHOOL CLASSES

Obtaining Cooperation of School Officials

State, county, and local school authorities should be made aware of the value of the land-use mapping project, and assurance of their cooperation must be obtained prior to the introduction of work in the classroom. State and the county school superintendents should ask the teachers of the cooperating schools to consider the mapping project as part of the school work, and to handle and direct it as such.

School executives are concerned with the use that is now being made of the land as it concerns school population, the tax base, and various other factors affecting school management. Consolidations and other steps tending toward a more efficient school system are to some extent dependent upon present and future land uses. Since the present land-use map is of assistance in the solution of some of the problems of school management, and as it also affords at little cost to the school a valuable educational enterprise for students, the interest and the cooperation of all school officials can usually be easily obtained.

Preliminary Data Necessary or Helpful

All data and maps that serve to reduce the amount of work to be done by students should be collected prior to starting the project in a school. Following are listed maps and data that are usually available:

An ownership map in some cases obtainable from the county agent or other county official, shows the name of the owner and the extent of his holding. In addition it should show the location of roads, railroads, rivers, lakes, etc., as it is necessary to be able to locate such features easily and accurately. The ownership map is the base for student mapping, and is therefore essential to the program. If such a map does not exist, then, some method must be found for securing one.

The official acreage of each section, or fraction thereof, should be obtained from the United States Land Office if possible. These data are helpful in areas of irregular surveys. Student mapping is usually done on idealized plats. However, for areas that are materially larger or smaller than the conventional "forty" or section, the supervisor should provide the students with plats drawn to scale showing the actual acreage. This applies to areas having the rectangular survey.

A road map of the county, which usually can be obtained from the county engineer, should be provided. This map is usually the only convenient source from which fairly accurate road locations may be obtained.

A cover map such as forest type maps, obtainable from the Forest Experiment Stations, is very valuable in timbered regions. These maps delimit the various types of forest cover, and give a generalized picture of the agricultural areas.

Improved land plats prepared from the county assessor's records, showing the location and the amount of improved land, and the location of improvements, aid materially in the location of small isolated farms.

Topography maps prepared by the United States Geological Survey are useful aids in determining the location of roads, rivers, lakes, etc.

Power and telephone line maps or data giving this information, may often be obtained from utility companies. These maps will save considerable time, and also eliminate a very common source of error and omission.

Aerial mosaics, such as those prepared for the highway departments and for the United States Army Engineers, should be obtained where available. The use of aerial mosaics eliminates a large amount of field work in the areas photographed, as the present land-use map may be made in large part directly from them.

School district maps showing the location of schools, school district boundaries, school bus routes, and data concerning the number of pupils and teachers should be obtained from the office of the county or state school superintendent. This information is needed primarily for the use of the Project Supervisor in allotting the areas to be mapped by the various schools.

Organizing the Local Survey

Each high school in the county should map its own district, unless the area to be mapped is so small that it would be impractical for the supervisor to take the time necessary to instruct the students in the mapping procedure. Districts having only a small amount of cultivated land and a small school are often in need of some land-use readjustment. These schools, if possible, should be persuaded to cooperate, as their participation in securing data to be used in a land classification program may be a helpful first step in bringing about desirable changes.

A study of county school district, forest type, and other maps and data will reveal the various schools whose cooperation is needed to map the county. After deciding what schools should cooperate, the supervisor should arrange to meet the teachers who will have charge of the mapping, or the superintendent of these schools. If the county is large and the schools are numerous, it may be advisable to have meetings in more than one place in order to assure the presence of a teacher from each school whose cooperation is desired in the mapping program.

Group Meeting with School Representatives

The meeting with the representatives of the various schools should be an informal affair in which the Project Supervisor should discuss thoroughly with the teachers the aims, objectives, values, and general methodology of present land-use mapping. The classes best fitted to do the mapping work are the Vocational Agricultural classes in the Smith-Hughes schools, and the agricultural classes in other high schools. In schools not offering courses in agriculture, a class consisting principally of boys should be chosen to do the mapping. More satisfactory results will be obtained if this class is taught by a man who has had some experience in mapping or land description.

Class periods for field work should be at least two hours long, but classroom periods, in which the students complete their maps, may be shorter. The most satisfactory method for getting the work done, is to devote either a half or whole day to field work, and such time in the classroom as is found necessary on the following day to complete the field maps. Usually about two hours "office work" will be required to complete a half day's field work. Each day's field work should be completed by transcribing it to the final map before starting any additional work in the field.

The student should first map the area surrounding his home, and should then assist in mapping the areas not having a sufficient number of students to map them.

The area to be mapped by each school will correspond closely with the school district boundary, although some modifications may possibly be found advisable where students live in one district and attend school in another. Odd shaped, large districts, or non-centrally located schools may also necessitate some changes. In some cases it may be convenient for districts to trade portions of their areas or to aid in mapping a district whose school is not cooperating. When the teachers and the supervisor have agreed upon the area that each school is to map, the county forest type and road map should be cut up in such a manner as as to give each teacher the portion of the map

covering his area. The supervisor will have to map all areas not assigned to any school for mapping.

In most cases the teacher will have immediate charge of the mapping; the supervisor's entire time will be required for general supervision and for giving the necessary instruction. The supervisor should set up a control map delimiting the area to be mapped by each school. Later when the field maps are completed and turned in to him, he should color in, on this control map, the areas mapped, using a separate color for each agency.

MAPPING INSTRUCTION TO BE GIVEN TO MAPPING CLASSES

The supervisor will require two class periods of two hours each, or their equivalent, to present the mapping instructions to the students. The first meeting should be held in the classroom, and the second in the field. Further instruction and aid will be required of the supervisor from time to time, and he should plan to visit each school at least once a week.

Classroom Instruction

At the beginning of the period the students should be provided with a transparent ruler, pencil, blank township or quarter-township plats, 4/ and a schedule showing the classifications to be mapped as these will be needed during the discussion. The instruction should consist of a discussion and explanation of all the steps that the student will take in obtaining the field data for the preparation of the land-use maps. Questions and comments on the part of students should be encouraged.

Defining and illustrating the land uses to be recognized and mapped should constitute the first step of the mapping instruction to the students. As the classifications are defined, the supervisor should point out the symbols used to indicate them upon the map. Various types of land-use may frequently be seen from a school window, and should be pointed out in illustration.

Methods of determining the size of land-use areas should be the next topic discussed. Distances will usually be determined by pacing, although speedometers on both automobiles and bicycles present other convenient methods of measuring distance. Or a count may be made of fence posts and the number multiplied by the distance be-

4/ See appendix for quarter-township plats used in this survey. Plats mimeographed in red ink would be suitable as pencil lines would be more distinct.

tween them. Telephone and power line poles may also be counted, but distances between poles vary considerably unless the line is straight and over level country. The plane table may be used, but this method is not suggested for use by the ordinary high school student. A knowledge of ownership and property lines is a material aid in determining the size of fields.

Locating a particular area upon the map is the next problem to be considered. This involves a knowledge of land description and measurement. A few words should be said about the history of the system of rectangular surveys in the United States. The system should then be described, beginning with base and meridian lines and progressing down through townships, sections, quarter sections, etc. It should be shown how each division carries out the rectangular system, and why the various parts are called the N$\frac{1}{2}$, the NE$\frac{1}{4}$, etc. At the same time, the dimensions in feet and the number of acres contained in each unit should be indicated; metes and bounds description should be discussed, and the students should be drilled in these details in order to fix in their minds the location and size of the various divisions of a section.

Drawing the areas in various land uses to scale should now be considered. Most students are somewhat familiar with maps, and know that a short distance on the map represents many times that distance on the earth's surface. They have, however, considerable trouble in determining the length of a line necessary to represent the length of a field. They were drilled earlier in the classroom discussion that a square of a certain size on the map represented a tract of land having a certain area and dimensions. Further development of this idea, the development of the ideas of proportion, and the presentation of the following table enabled most students to grasp the method fairly easily:

Table of Comparable Distances and Areas

Distance on the Earth's Surface				Corresponding Distance on Map Scale 2 in. = 1 mi.	Acres Contained in a Square of That Size
Miles	Chains	Rods	Feet	Inches	
1	80	320	5280	2	640
1/2	40	160	2640	1	160
1/4	20	80	1320	1/2	40
1/8	10	40	660	1/4	10
1/16	5	20	330	1/8	2.5
1/32	2.5	10	165	1/16	.625

The students should be shown how to prepare the field base maps on which they will indicate the land-use and improvements. These maps prepared from the ownership, topography, or other maps, should show the location of roads, railroads, rivers, lakes, etc.

All the points discussed in the classroom should now be summarized and put into practice by having the students prepare a map accurately drawn to scale, of areas of given land-use and dimensions. The supervisor should outline this area roughly on the blackboard. Dimensions should be given in paces, which the students should convert to feet, and then to distances on a map.

The Field Instruction Trip

The field instruction trip, which should take place very shortly after the classroom discussion, should illustrate the method to be used by the students in field mapping. It puts into practice the things they were told in the classroom. The demonstration area should contain most of the land uses to be found in the school district, but they should be few enough in number to afford relatively rapid coverage. To save time the supervisor should prepare the field plats for this trip.

Before going into the field the supervisor should have the students determine the length of their pace by pacing a known distance several times. The pupils should be required to walk in a normal manner; otherwise they will try to take a pace of three feet -- a pace they cannot maintain. It has been found that the average length of a student's pace is 25 to 30 inches.

Upon arrival at the area to be mapped, students should be shown how to orient their maps with their position in the field. Reference to the road map will show approximate locations, and exact locations may be determined from the ownership map if the owner's name is known. If necessary, inquiry may be made of the owner as to the description of the farm and the location of property lines. If there are any errors in the location of natural features on the base map, they should be pointed out, and students directed to make the necessary corrections.

It is not necessary to find section or township corner markers. If they can be found readily, they should be pointed out to the students, as in some areas it may be necessary to establish location from such landmarks, but in most cases, location can be determined by knowledge of the country, by use of ownership maps, or by inquiry.

After the students have located themselves, they should indicate the various improvements on their field map. Then they should determine the classification of the areas being mapped, and should be directed to make the necessary measurements of these land-use areas. These areas should be accurately sketched in on their field map. The dimensions of land-use area boundaries should be given in number of paces. Each student should map the area independently.

After the preliminary map has been made the field party should return to the classroom and the students should be instructed in the preparation of the final map. The supervisor should sketch the map of the area on the blackboard; simultaneously the students should draw the map to scale on their quarter-township plats. As the supervisor calls upon the students for the various dimensions in feet (which they have previously converted from paces) which he needs for sketching his map, it will probably be found that no two students will have the same measurements. This will very definitely convince the student of the necessity for accurate pacing, and for the use of a natural pace. After the students have completed their maps, they should redetermine the length of their pace.

This completes the formal instruction to the students. They should now be able to proceed with the land-use mapping; however, they will require further assistance from the supervisor from time to time and at all times close supervision and assistance from the instructor.

Checking the Final Student Maps

The teacher and the supervisor should carefully check the final maps before they are sent to the drafting room. Adjoining maps should be fitted together to see that roads, rivers, etc. meet. The maps should be compared as to cover, topography, road, and other maps, and any discrepancies should be checked.

The accuracy of the map, and the time required to complete it, depends to a very great extent upon the understanding and cooperation of the teacher who has immediate charge of the mapping.

Each school should prepare a control map from the quarter-township present land-use plats, indicating by means of colors the various cover that is found. This will provide a progress map during the time they are doing the mapping, and a land-use map of their area when they are through. These school maps should be of uniform scale, usually two inches to the mile, with a uniform legend throughout the county, so that all the maps may be fitted together for exhibition purposes at county or state fairs or similar functions, and for other uses.

PREPARING THE FINAL COUNTY MAP

The final county present land-use map should be drafted at headquarters by trained draftsmen. The map as prepared in the State of Washington, a copy of which follows this discussion, was made in two parts, one map showing land-use, main highways, railroads, principal towns, and rivers; the other, all improvements, roads, towns, and rivers. (See Page 11)

Two methods were used in transferring the data from the field plats to final maps. Field maps were made on a scale of two inches to the mile; county maps on a scale of one inch to the mile. In one process the data were reduced as they were transferred to the final map; in the other the field maps were traced, photostated to the desired scale, and the final map made by tracing the photostat.

It is suggested that a list, by schools, of all teachers and pupils who participated in the work be appended to or printed on the final county map.

CONCLUSION

The foregoing presents a picture of the job of present land-use mapping as it was carried on in six counties in western Washington during the fall and winter of 1935-36. The methodology of doing the work is the result of the experience gained in these six counties. The various forms and the instruction sheet presented to the students follow. All supplies, including transparent rulers, lead and colored pencils, were furnished to the students.

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T 15 N

T 14 N

T 13 N

T 12 N

T 11 N

T 15 N

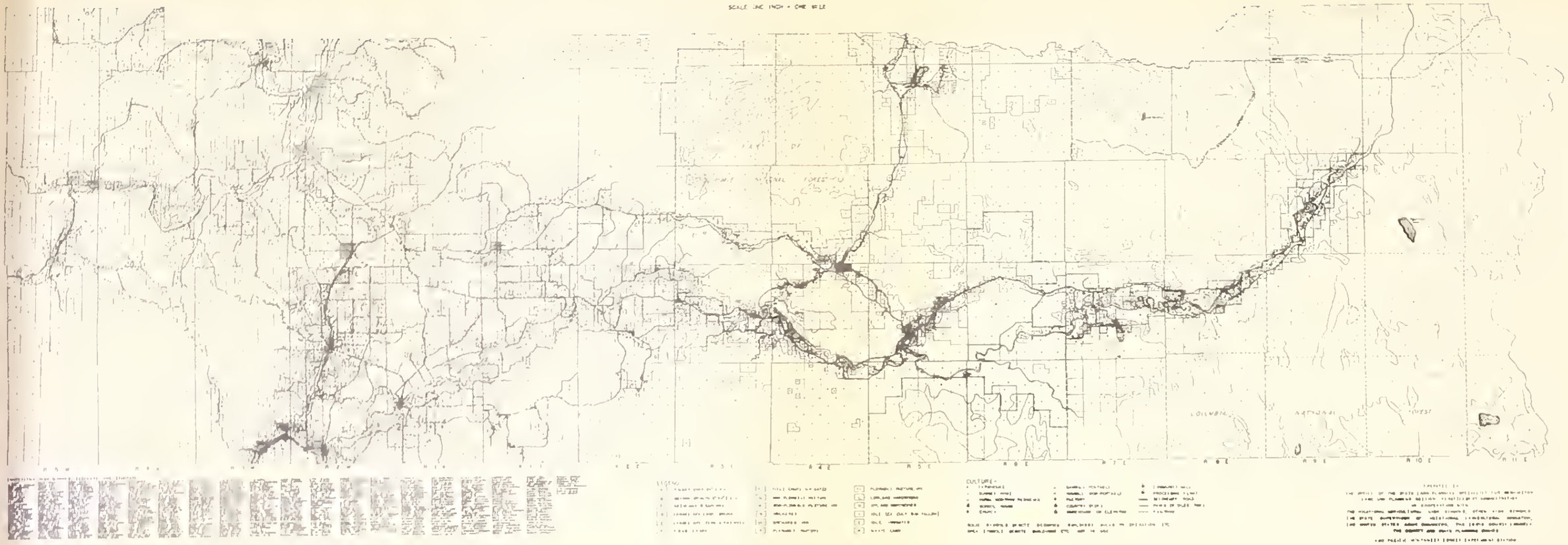
T 14 N

T 13 N

T 12 N

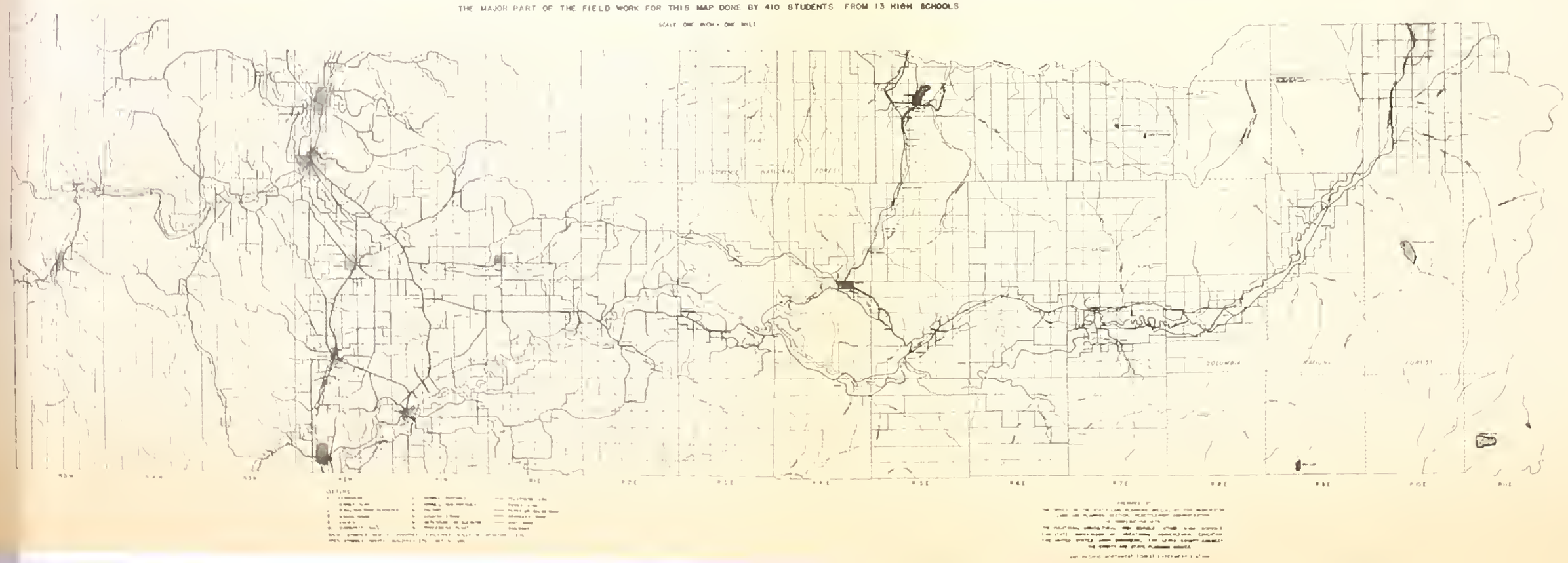
T 11 N

PRESENT LAND USE, LEWIS COUNTY WASHINGTON, 1936



PUBLIC AND PRIVATE IMPROVEMENTS, LEWIS COUNTY, WASHINGTON, 1936

THE MAJOR PART OF THE FIELD WORK FOR THIS MAP DONE BY 410 STUDENTS FROM 13 HIGH SCHOOLS

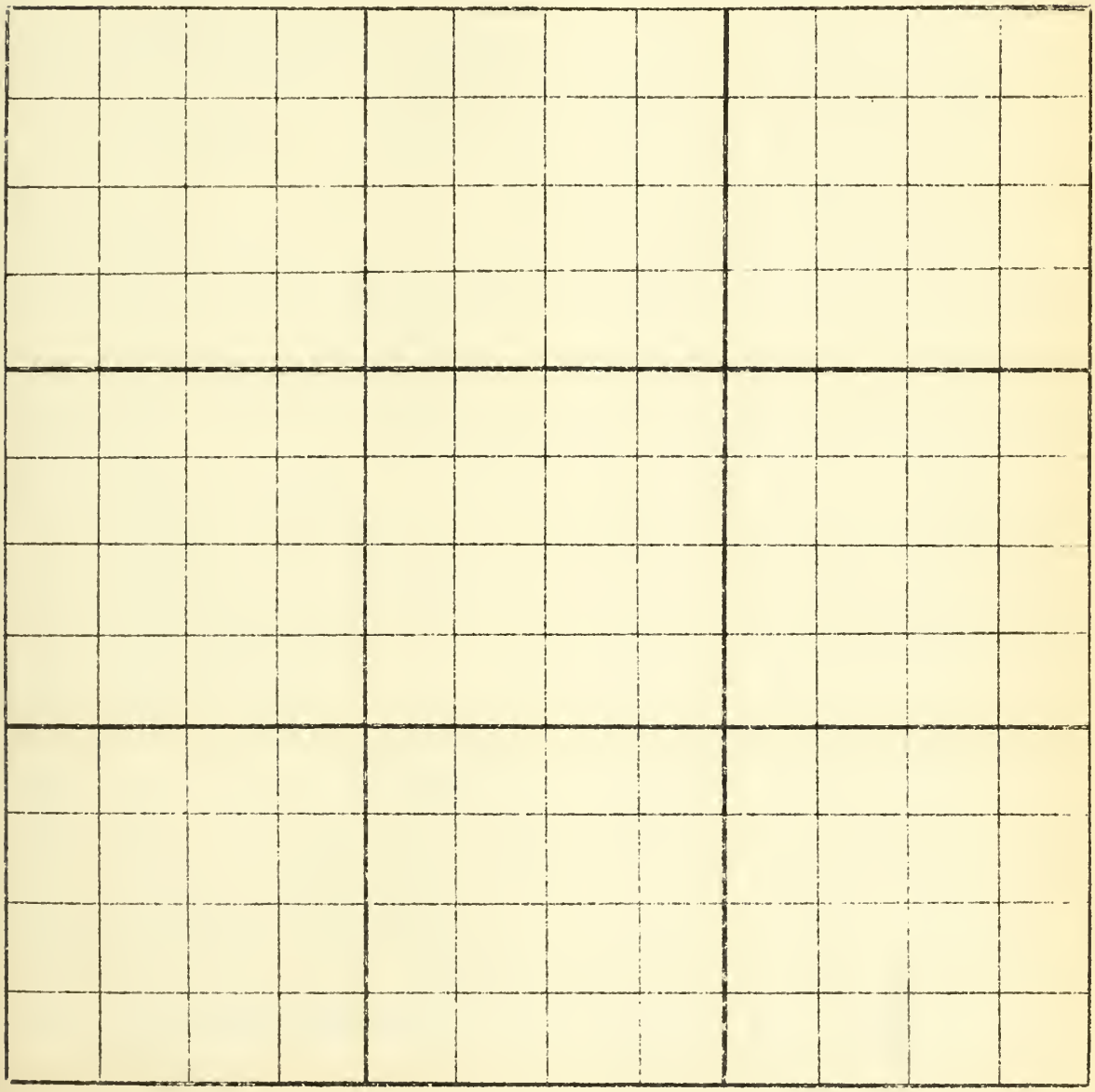


PRESENT LAND USE SURVEY

Quarter Township Plat

Township_____ Range_____ Quarter_____ County

Aerial___ School___ Field_____ (check which) Date_____



QUARTER TOWNSHIP STUDY SUMMARY PRESENT LAND USE, ____ COUNTY, WASHINGTON, 1935

Twp. _____ Rge. _____ Qtr. _____	Section Numbers						Tot.
TIMBER	Smbl						
1.Timber over 20" D.B.H.	Tl						
2.Second growth 6"-20" D.B.H.	Tm						
3.Seedlings & saplings 0-6" D.B.H.	Ts						
4.Lowland hardwoods	Thl						
5.Upland hardwoods	Thu						
LOGGED-OFF LAND							
6.Non restocking (brush)	Lb						
7.Non restocking (fern & fireweed)	Lf						
8.Non plowable pasture	Pn						
9. " " " (irr.)	Pni						
10.Plowable pasture	Pp						
11. " " (irr.)	Ppi						
CROPLAND							
12.Field Crops (non irr.)	Cf						
13.Field crops (irr.)	Cfi						
14.Orchard, vineyards, nuts	Co						
15. " " " (irr.)	Coi						
16.Idle & fallow (ex.cult.s.f.)	Ca						
17.Idle & fallow, irr.	Cai						
18.Waste land (gravel bars etc.)	W						
TOTAL							
IMPROVEMENTS							
19.No. occupied farmhouses							
20.No. unoccupied farmhouses							
21.Summer homes							
22.No. rural non farm residences	u						
23.No. schools in use							
24.No. schools not in use							
25.No. churches in use							
26.No. churches not in use							
27.No. sawmills in oper., portable							
28.No. " " " non port.							
29.No. " not in operation							
30.No. mills & fact. (Oth.s.m.) in oper.	f						
31.No. " " (") not " "	f						
32.No. stores, all types (open country)	s						
33.No. warehouses or elevators	w						
34.No. community or lodge halls in use	c						
35.No. " " " " not in use	c						
36.No. processing plants in use	p						
37.No. processing plants not in use	p						
38.Roads, dirt	---						
39.Roads, with gravel, crshd rock etc.	—						
40.Roads, bound macadam, pave. etc.	═						
41.Telephone lines	⊥⊥⊥						
42.Electric power lines	ooo						
43.Railroads	|||||							

INSTRUCTIONS FOR MAPPING PRESENT LAND USE

Instructions Preparatory to Field Work

Materials

1. Metsker township plat (An ownership map in the State of Washington)
2. Present land use survey quarter township outline maps
3. Transparent 6-inch ruler
4. Lead pencil
5. (You will need access to a light table, or if a light table is not available, you can trace ownerships from Metsker map on your outline map by placing the maps on a window and fastening them with tape.)

Procedure

On the Metsker township plat, locate the area you intend to cover. Place your field map over that portion of the Metsker map that includes the area which you are to map. Place your field map in such position that the section lines on this map coincide with the section lines on the Metsker map. Place the two maps on a transparent surface (light table or window). By doing this the light will shine through and you can trace lines on your field map from the Metsker map. Draw in all roads, lakes and streams; also the boundaries of all towns. Map in the boundaries of several farms with which you are acquainted, and trace in the ownership names for these farms. The farm boundaries and ownership names will help you to locate yourself at all times when you are in the field. Note the position of the area which you are to map relative to your home farm or school, and determine a route for arriving at the area you are to map.

Prepare an exact duplicate of the map you have been instructed to make. Make this in the same way as the first map. The first map will be used for mapping in improvements, such as houses, schools, railroads, telephone lines etc., and the second map will be used for mapping land-use.

The entire purpose of work preparatory to entering the field is to acquaint yourself with as many of the conditions as possible from the Metsker map, and to do as much of your work as possible without mapping the actual land-use. All of this will be an aid and guide to you after you arrive on the land, and will tend to lighten your actual work.

Instructions for Field Work

Materials

1. 1 set of field sheets (2 maps and 1 summary sheet)
2. 9x12 ply-board with clip, rubber bands or thumb tacks
3. Transparent 6-inch ruler fastened to board with cord
4. No. 3 lead pencil fastened to board with cord

Procedure

Upon arriving at the point which you have determined as the starting point for your mapping, locate yourself thoroughly on your map. If you are standing at a crossroad, on a road, or on a farmer's property which is shown on your map, locate on your map your present position. Turn the map so that it corresponds with the lay of the land, keeping in mind that the top of your map is north. This will make it a great deal easier to locate the different characteristics correctly on your plat.

It may be necessary upon entering the field to make certain changes on your field map of entries made from the Metsker map. There may be new roads that were not shown on the Metsker, or there may have been changes made in the road. Rivers may even have changed their courses to a certain extent. However, before making any changes, be sure that they are really changes, and not merely differences when viewed first hand.

Have your ruler with you at all times so that you can draw in your lines as correctly as possible. Use the pencil with which you will be provided, and keep it well sharpened.

From where you are standing, map in all improvements on the map marked "improvements". For example, if you are standing on a road, place this road on your map, indicating the type of road and let it extend as far as you can accurately locate it. Map in buildings, telephone and power lines etc., being certain to classify them accurately by constant reference to your summary sheet. Go down the list of improvements on your summary sheet carefully to make sure that you have not omitted anything from your map that may be present on the land. Be sure that the symbols which you have placed on your map are correct both as to kind and location, and that they are absolutely legible.

Next determine the types of land in your vicinity. Classify this land carefully by reference to your summary sheet, and place it on your map. It may be possible to determine the location and size of a field by sight, but it will be necessary in most cases to pace off the field to determine its area. When you have correctly determined the area and location of the field with your ruler, draw it on your map to scale with a pencil line, keeping the following things in mind:

Each small square on your map is the equivalent of forty acres;

Each one-half ($\frac{1}{2}$) inch square on your ruler is also equivalent to forty acres;

Each one-forth ($\frac{1}{4}$) inch square is the equivalent of ten acres;

The smallest square on the ruler equals two and one-half ($2\frac{1}{2}$) acres.

When you have completed outlining the field on your map in pencil and are certain that it is correct in dimension and position, place the correct symbol legibly within the area on your map.

Continue this procedure throughout the area which you have undertaken to map.

When you have completely covered the area which you set out to map and have it represented on your map, before leaving the field check for the following things:

See that no area has been omitted from your map;

See that the acreages are correctly represented to scale;

See that you have correctly classified the uses according to your summary sheet;

Be sure that the types are correctly labeled;

Be sure that you have located the types correctly on your map.

You may find it desirable to make notes on your field map to use as a guide in drawing your final map. You may even indicate acreage figures on your field map, dimensions of fields or anything that will be an aid to you in drawing up your final map and summarization.

Instructions for Final Mapping and Summarization

The final maps will be a neat, accurate copy of the field maps with all unnecessary notes eliminated.

Improvement Map

On your final improvement map place all improvements in their correct position, using your ruler and keeping in mind that each inch is equivalent to one-half mile. Be sure that you classify the improvements correctly using the correct symbol. Make these symbols very legible. Where a road, power or other line runs along a section, township or quarter line, if you cannot make the symbol distinct beyond a doubt by placing it on the line, place it parallel to it.

Land Use Map

In drawing the type acreages on your final map, use extreme care in drawing them to scale with your ruler so that the actual acreages as they were in the field show as the correct numbers of acres on the map. Place the correct symbols on your final map neatly and distinctly, using a well pointed pencil.

When you have completed your final maps, fill in your summary sheet from these maps. Enter total acres of each type in each section in the proper column on the summary sheet. Be sure that the acreages which you enter on the summary sheet correspond with the acreages on your map. Also be sure that the total for all acreages in a section is equal to the total number of acres in the section -- that is, 640 acres if it is a regular section. If they do not equal 640 acres or the section total, check back to determine to which type or types you have given too much or too little acreage.

List the total number or the number of miles of each type of improvement in the section on the summary sheet. Use extreme caution to see that you place your figures in the correct column. When a road, power, telephone line or railroad follows a line between two sections, count one-half the length in the summary for each section.

When you have made certain that your final map and summary is a correct representation of the area you have covered, attach it to your field maps and turn it in to your instructor for correction.

Be sure you have been assigned a definite area to map. This will prevent omission or duplication.

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